

# High Volume Manufacturing of NanoEngineered High ZT Thermoelectrics for Multiple Energy Generation Applications, Phase I

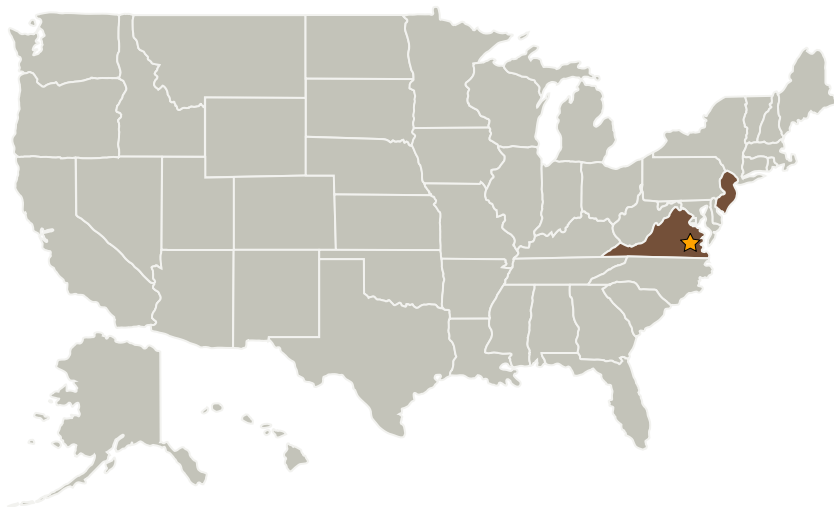
Completed Technology Project (2009 - 2010)



## Project Introduction

SMI has teamed with a leading thermoelectric (TE) research group in order to optimize and convert high-performance TE materials developed in laboratory-scale into economically producible products for NASA missions and commercial applications. Recent results with nanocomposite films have shown that Figures of Merit (ZT) much greater than 1.0 are possible at laboratory-scale; however a technology road map with the view towards large-volume and low-cost manufacturing processes of such TE devices has not previously been envisioned. We propose to develop a scalable manufacturing process of large-volume and cost-effective nanocomposite TE device films with ZT values exceeding 2.0. In Phase I, SMI and our partner will demonstrate a scalable manufacturing technology for nanocomposite films required for high-performance TE devices. In Phase II, we will continue materials development, device optimization, and process scaling to large-scale production. Further, we will market the technology with end product producers. The Phase III result will be the availability of high-performance TE devices that utilize nanocomposite films for NASA applications, commercial uses in general, and the new energy frontier of waste heat recovery.

## Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
★ Langley Research Center (LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Structured Materials Industries, Inc.	Supporting Organization	Industry	Piscataway, New Jersey

Primary U.S. Work Locations	
New Jersey	Virginia

## Project Transitions

**January 2009:** Project Start**January 2010:** Closed out

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Langley Research Center (LaRC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Gary S Tompa

## Technology Areas

**Primary:**

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - └ TX12.4 Manufacturing
    - └ TX12.4.1 Manufacturing Processes